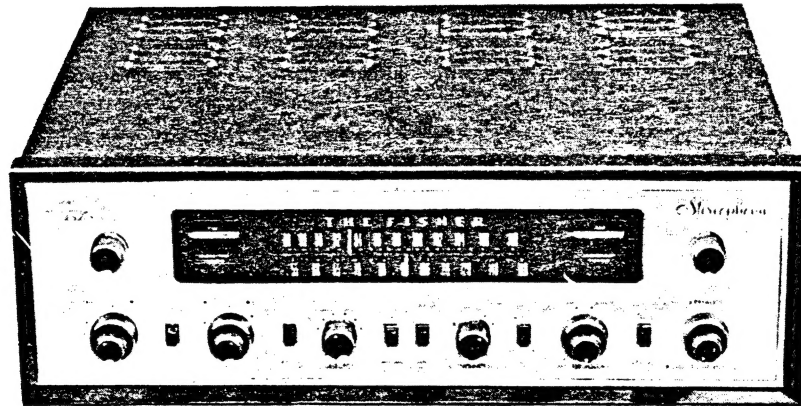




Stereophonic
THE FISHER 202-T
SERVICE
MANUAL



MODEL 202-T

CHASSIS SERIAL NUMBERS
FROM 30001 TO 39999 INCLUSIVE

S DESCRIPTION LIST • TUNER AND PREAMPLIFIER

CAPACITORS

10% tolerance for all fixed capacitors, unless otherwise noted or marked GMV (guaranteed minimum value.)

Symbol	Description	Part No.
C1	Ceramic, 24uuf 5% N150, 1000V	C50070-8
C2	Ceramic, 8 uuf ± .5uuf NPO; 500V	CC20CJ080D5
C3	Ceramic, 5uuf ± .5uuf NPO; 500V	CC20CJ050D5
C4	Ceramic, 100uuf N1500; 1000V	C50070-6
C5	Ceramic trimmer	C662-123
C6	AM variable	C684-127
C7	FM variable	C726-116
C8	Ceramic, 100 uuf GMV, N1500; 1000V	C50070-5
C9	Ceramic, 100 uuf N1500; 1000V	C50070-6
C10, 11, 12	Ceramic, Feedthru, .001 uf GMV	C592-187
C13	Ceramic, .02uf + 80 — 20%; 500V	C50089-4
C14	Ceramic, Feedthru, .001 uf; GMV	C592-187
C15	Ceramic, .02uf + 80 — 20%; 500V	C50089-4
C16	Ceramic, .001uf; 1000V	C50072-3
C17	Ceramic, .02uf + 80 — 20%; 500V	C50089-4
C18	Ceramic, .005uf 20%; 500V	C50089-1
C19	Ceramic, 8uuf ± .5uuf; NPO, 500V	CC20CJ080D5
C20	Ceramic, .68uuf, 500V	C50077-6N
C21	Ceramic, Trimmer	C662-123
C22	Ceramic, 10uuf ± .5uuf; NPO; 500V	CC20CJ100D5
C23	Ceramic, 100uuf, N1500; 1000V	C50070-6
C24	Ceramic, 100uuf, GMV, N1500, 1000V	C50070-5
C25	Ceramic, 68uuf, N750; 500V	CC20UJ680K5
C26	Ceramic, 100uuf, N1500; 1000V	C50070-6
C27	Molded, .01uf 20%; 600V	C2747
C28	Ceramic, 5uuf ± .5uuf N150, 500V	CC20PJ050D5
C29	Ceramic, 5uuf ± .5uuf N220, 500V	CC20RH050D5
C30	Ceramic, 47uuf N750; 1000V	C50070-4
C31	Ceramic, trimmer	C662-123
C32	Ceramic, feedthru .001uf GMV	C592-187
C33	Ceramic, 10uuf ± .5uuf NPO; 500V	CC20CJ100D5
C34	Ceramic, 24uuf 5%; N150; 1000V	C50070-8
C35	Ceramic, 100uuf GMV, N1500; 1000V	C50070-5
C36	Ceramic, 100uuf 5%, N1500; 1000V	C50070-19
C37	Ceramic, .001uf, 1000V	C50072-3
C38	Ceramic, feedthru .001 uf GMV	C592-187
C39, 40	Ceramic, .02uf + 80 — 20% 500V	C50089-4
C41	Ceramic, .005uf 20%; 500V	50089-1
C42	Electrolytic four section: A 40uf 350V B 40uf 300V C 40uf 300V D 40uf 250V	C50180-3
C43	Electrolytic to section: A 1000uf 30V B 1000uf 30V	C50180-7
C44	Ceramic feedthru .001uf GMV	C592-187
C45	Mica, 470uuf 5%, 300V	C3334
C46, 47	Ceramic, .005uf 20%; 500V	C50089-1
C48	Ceramic, .0027uf, 1000V	C50072-17
C49	Electrolytic, three section: A 40uf 250V B 40uf 250V C 40uf 250V	C50180-4
C50, 51, 52	Ceramic, .005uf 20%; 500V	C50089-1
C53	Mica, 470uuf, 5%; 300V	C3334
C54	Mylar, .047 uf; 250V	C50197-52
C55	Electrolytic, two section: A 40uf 250V B 40uf 250V	C50180-5
C56	Ceramic, .005uf 20%; 500V	C50089-1
C57	Ceramic, .02uf + 80 — 20%; 500V	C50089-4
C58	Ceramic, .0027uf, 1000V	C50072-17
C59	Ceramic, .02uf + 80 — 20%; 500V	C50089-4
C60, 61	Ceramic, .005uf 20%; 500V	C50089-1
C62	Mica, 470 uuf 5%; 300V	C3334
C63, 64	Ceramic, .005uf, 20%, 500V	C50089-1
C65	Ceramic, 47uuf, N750; 1000V	C50070-4
C66	Ceramic, 220uuf 1000V	C50072-20
C67	Mica, 470uuf 5%; 300V	C3334
C68	Ceramic, 220 uuf, 1000V	C50072-20
C69	Ceramic, .0027uf; 1000V	C50072-17
C70	Ceramic, .005uf 20%; 500V	C50089-1
C71	Ceramic, .02uf + 80 — 20%; 500V	C50089-4
C72	Ceramic, 5uuf ± .5uuf; NPO; 500V	CC20CJ050D5
C73	Ceramic, 24uuf, 5%; 1000V	C50070-8
C74	Ceramic, .005uf 20%; 500V	C50089-1
C75	Electrolytic, 2uf; 70V	C721-142
C76	Mylar, .1uf 10%; 250V	C50197-54
C77, 78	Ceramic, .005uf 20%; 500V	C50089-1
C79	Ceramic, 1uuf, 20% P100; 100V	C50070-1

C80	Ceramic, .005uf 20%; 500V	C50089-1
C81	Ceramic, 560uuf; 1000V	C50072-14
C82	Ceramic, 12uuf; NPO, 1000V	C50070-2
C83, 84	Ceramic, .005uf 20%, 500V	C50089-1
C85	Mica trimmer	C629-151-5
C86	Ceramic, .0027uf 1000V	C50072-17
C87	Ceramic, 12uuf, NPO, 1000V	C50070-2
C88	Mylar, .047uf, 250V	C50197-52
C89	Ceramic, .005uf 20%; 500V	C50089-1
C90	Ceramic, 220uf, 1000V	C50072-20
C91	Mylar, .047uf 250V	C50197-52
C92	Ceramic, .005uf 20%; 500V	C50089-1
C93	Ceramic, .02uf + 80 — 20%, 500V	C50089-4
C94, 95	Ceramic, 330uuf, 1000V	C50072-1
C96	Mylar, .015uf, 250V	C50197-58
C97	Ceramic, 820uuf, 5%; 500V	CC21GP821J5
C98	Ceramic, 330uuf, 1000V	C50072-1
C99	Ceramic, .0033uf; 1000V	C50072-11
C100	Electrolytic, 8uf, 50V	C629-138
C101	Mylar, .1uf, 250V	C50197-54
C102	Ceramic, .005uf, 20%; 500V	C50089-1
C110, 111	Ceramic, 220uuf, 1000V	C50072-20
C112, 113	Ceramic, 100uuf, GMV; 1000V	C50070-5
C114, 115	Mylar, .01uf, 250V	C50197-48
C116, 117	Mylar, .022uf, 250V	C50197-49
C118, 119	Ceramic, 33uuf, 5%, N750, 1000V	C50070-25K
C120, 121	Ceramic, 2700uuf; 1000V	C50072-17
C122	Ceramic, .0033uf; 1000V	C50072-11
C123	Electrolytic, 25uf; 6V	C639-114
C124	Ceramic, .0033uf; 1000V	C50072-11
C125	Electrolytic, 25uf, 6V	C639-114
C126, 127	Mylar, .047uf, 250V	C50197-52
C128, 129	Ceramic, .005uf, 20%; 500V	C50089-1
C130, 131	Mylar, .68uf; 250V	50197-57
C132, 133	Mylar, .027uf, 250V	50197-50
C134, 135	Ceramic, 330uuf; 1000V	C50072-11
C136, 137	Ceramic, 24uuf 5% N150 1000V	C50070-8
C138, 139	Mylar, .1uf; 250V	C50197-54
C140	Electrolytic, 25uf, 6V	C639-114
C141	Ceramic, .001uf; 1000V	C50072-3
C142	Electrolytic, 25uf; 6V	C639-114
C143	Ceramic, .001uf; 100V	C50072-3
C144, 145	Electrolytic, 25uf; 6V	C639-114
C146, 147	Mylar, .1uf; 250V	C50197-54
C148, 149	Ceramic, .02uf + 80 — 20%; 500V	C50089-4
C150, 151, 152, 153, 154	Mylar, .1uf; 250V	C50197-54
C155, 156	Ceramic, .001uf, GMV, 500V	C50089-2
C157	Electrolytic, 8uf, 50V	C629-138
C158	Mylar, .047uf, 250V	C50197-52
C159	Electrolytic, 1uf, 250V	C546-126
C160, 161	Ceramic, 330uuf, 1000V	C50072-1

RESISTORS AND POTENTIOMETERS

In ohms, 10% tolerance, 1/2 watt, unless otherwise noted. K = kilohm, M = megohm.

Symbol	Description	Part No.
R1	Composition 330	RC20BF331K
R2	Composition 2.7K	RC20BF272K
R3	Composition 330	RC20BF331K
R4	Composition 1K	RC20BF102K
R5	Composition 4.7	RC20BF477K
R6	Composition 100K	RC20BF104K
R7	Composition 4.7M	RC20BF475K
R8	Composition 120	RC20BF121K
R9	Composition 3.3M	RC20BF335K
R10	Composition 120	RC20BF121K
R11, 12	Composition 330K	RC20BF334K
R13	Composition 47K	RC20BF473K
R14	Composition 1K	RC20BF102K
R15	Composition 22	RC20BF220K
R16	Composition 2.2K	RC20BF222K
R17	Composition 4.7	RC20BF477K
R18	Composition 820K	RC20BF824K
R19	Composition 1K	RC20BF102K
R20	Composition 100	RC20BF101K
R21	Composition 470K	RC20BF474K
R22	Composition 22K	RC20BF223K
R23	Composition 1K	RC20BF102K
R24	Composition 2.2K, 1W	RC30BF222K
R25	Wirewound 10Q 5W	R592-185
R26	Composition 22K; 1W	RC30BF223K
R27	Composition 120	RC20BF121K
R28	Composition 1.2K; 1W	RC30BF122K
R29	Wirewound 400, 5%; 5W	R621-130
R30	Wirewound 12, 5W	R721-141

NEW INSTRUCTIONS WITH EXTREME CARE BEFORE ATTEMPTING ALIGNMENT.

CHASSIS: Turn the station selectors completely counterclockwise, without forcing. Dial pointers should be at zero index mark on logging scale. If not, reset the dial pointers. Disconnect the external antennas and the antenna link. Set Ferrite Loop to normal position, parallel to rear panel. When using an oscilloscope for alignment, set the output level controls for no overload, as shown by the proper waveform shape.

AM IF with 30 KC sweep for AM bandwidth adjustment; audio oscillator accurately calibrated for 1 and 10 KC audio output for testing the 10 KC AM whistle filter.

INDICATOR: DC VTVM, AC VTVM, and scope for alignment.

ALIGNMENT: Allow the chassis and test instruments to warm up for at least fifteen minutes. Adjust the line voltage for 117 volts AC, 50-60 cycles. Use fully insulated tools: a small screwdriver for all trimming capacitors; a K-Tran tool for Z1, Z2, Z3, Z6, Z7, Z8 and Z9; a hex tool for Z4, Z5, L2, L9, L10, L15 and L16. For AM alignment, connect a 1.4 volt battery between the junction of R68/C54 and ground. Positive side of battery to ground.

SIGNAL GENERATORS: The signal generator equipment must be able to supply the following:
FM RF modulated 30% (± 22.5 KC deviation) at 400 cps; AM RF modulated 30% at 400 cps;

AM ALIGNMENT

STEPS	CHASSIS			SIGNAL GENERATOR			INDICATOR		ALIGNMENT	
	AM BANDWIDTH	SELECTOR	MONO-STEREO	STATION SELECTOR	COUPLING	FREQ.	MOD.	TYPE	CONNECTION	ADJUST
1	SHARP	FM-AM	B (AM)	Point of no signal and no interference	Audio Gen. connected thru .01-uf cap. in series with hot lead to V10 Pin 1	10 KC	None	AC VTVM to Ch. B Recorder Output	DC VTVM to Test Point 7	Minimum Output
2	SHARP	FM-AM	B (AM)	Point of no signal and no interference	AM RF Gen. connected thru .01-uf cap. in series with hot lead to V10 Pin 1	455 KC	30% AM at 400 cps	DC VTVM to Test Point 7	Scope to Ch. B Recorder Output	Maximum negative voltage
3	BROAD	FM-AM	B (AM)	Point of no signal and no interference	AM Gen. connected thru .01-uf cap. in series with hot lead to V10 Pin 1	455 KC	30 KC sweep	DC VTVM to Test Point 7	Scope to Ch. B Recorder Output	Adjust slightly for symmetrical curve
4	SHARP	FM-AM	B (AM)	600 KC	AM Gen. connected thru 220-uf cap. in series with hot lead to antenna terminal 3	600 KC	30% AM at 400 cps	DC VTVM to Test Point 7	Scope to Ch. B Recorder Output	Check for sine waveform Maximum negative voltage
5	SHARP	FM-AM	B (AM)	1400 KC	AM Gen. connected thru 220-uf cap. in series with hot lead to antenna terminal 3	1400 KC	30% AM at 400 cps	DC VTVM to Test Point 7	Scope to Ch. B Recorder Output	Check for sine waveform Maximum negative voltage
6	Repeat steps 4 and 5 for proper dial calibration and maximum output.									

FM ALIGNMENT

7	FM Muting Switch Off	FM-AM	A (FM)	Point of no signal and no interference	FM Generator connected to Pin 1 of V4	10.7 MC	None	Connect VT VM to test point 2	Z4, Z5 top & bottom	Maximum negative voltage (below -5 volts) See Note 2
8	FM Muting Switch Off	FM-AM	A (FM)	Point of no signal and no interference	FM Generator connected to Pin 1 of V4	10.7 MC	None	DC VTVM to test point 4	Z5 top	Zero reading on zero center scale
9	FM Muting Switch Off	FM-AM	A (FM)	Point of no signal and no interference	FM Gen. connected to ungrounded tube shield of V2	10.7 MC	None	DC VTVM to test point 1	Z1, Z2, Z3 top & bottom	Maximum negative voltage (below -2 volts) See Note 2
10	FM Muting Switch Off	FM-AM	A (FM)	90 MC	FM Gen. connected thru two 120-ohm carbon resistors in series with lead to antenna terminals 5 and 6	90 MC	30% FM (22.5 KC Dev.) at 400 cps	DC VTVM to test point 1, and scope to Ch. A Recorder Output	L10, L9 L2	Check for sine waveform and adjust for maximum negative voltage
11	FM Muting Switch Off	FM-AM	A (FM)	106 MC	FM Gen. connected thru two 120-ohm carbon resistors in series with lead to antenna terminals 5 and 6	106 MC	30% FM (22.5 KC Dev.) at 400 cps	DC VTVM to test point 1, and scope to Ch. A Recorder Output	C31, C21 C5	Check for sine waveform and adjust for maximum negative voltage
12	Repeat steps 10 and 11 at least once for proper dial calibration and maximum output.									

NOTE: 1 — For calibrating both the AM and FM, use as low an output voltage as possible from your signal generator.
2 — Decrease Signal Generator output while adjusting IF transformers so that DC VTVM shows no more than noted voltage.
3 — If adjustment of muting oscillator is necessary, adjust it for 3 MC with a Grid-dip Meter.

1 Composition 1K
2 Composition 1.2K, 1W
3 Wirewound 400, 5%, 5W
4 Composition 47K
5 Composition 82K
6 Composition 1.8M
7, 38 Composition 1K
9, 40 Composition 270
1 Composition 1K
2 Composition 10K
3 Composition 68K
4 Composition 470K
5 Composition 120
6 Composition 100
7 Composition 10K
8 Composition 100K
9 Composition 1.8M
10 Composition 15M
11 Composition 3.3M
12 Composition 68K
13 Composition 56K
14 Composition 470
15 Composition 470K
16 Potentiometer 250K, muting
17 Composition 1K
18 Composition 220K
19 Composition 470K
20 Composition 47K
21 Composition 150K
22 Composition 100K
23, 64 Composition 270
25 Composition 1.2M
26 Composition 100K
27 Composition 82K
28 Composition 2.2M
29 Composition 1K
30 Composition 220K
31 Composition 820K
32 Potentiometer 250K, AM level set
33 Composition 15K
34 Composition 220K
35 Composition 1K
36 Composition 220K
37 Composition 27K
38 Composition 100
39 Composition 18K
40 Composition 47K
41 Composition 1K
42 Composition 47K
43 Composition 22K, 1W
44 Composition 1K
45 Composition 3.3M
46 Composition 270
47 Composition 180
48 Composition 470K
49 Composition 100K, 5%
50 Composition 68K
51 Composition 1.5K
52 Composition 1K
53, 94 Composition 6.8K
55 Composition 330K
56 Composition 33K, 5%
57 Potentiometer 100K, MPX, Control
58 Potentiometer 250K, Tape rec. level ch. A
59, 107 Potentiometer 82K
61 Potentiometer, 250K, Tape rec. level ch. B
62 Composition 100K
63 Composition 10K
64 Composition 100K
65 Composition 10
66 Composition 10K
67 Composition 10
68 Composition 330K, 1W
69 Composition 2.7K, 1W
70 Composition 330K, 1W
71 Composition 2.7K, 1W
72, 120 Composition 4.7M
73, 122 Composition 220K
74, 124 Potentiometer, 250K, Phono Level Sets
75, 126 Dep. carbon, 470K, 5%, 1/3W
76, 129 Composition 3.9M
77 Composition 1M
78 Composition 1M
79, 132 Composition 470
81 Composition 270K
82, 135 Composition 330K
83 Composition 270K
84, 138 Composition 47K

RC20BF102K
RC30BF122K
R621-130
RC20BF473K
RC20BF823K
RC20BF185K
RC20BF102K
RC20BF271K
RC20BF102K
RC20BF103K
RC20BF683K
RC20BF474K
RC20BF121K
RC20BF101K
RC20BF103K
RC20BF104K
RC20BF185K
RC20BF156K
RC20BF335K
RC20BF683K
RC20BF563K
RC20BF471K
RC20BF474K
R50160-3
RC20BF102K
RC20BF224K
RC20BF474K
RC20BF473K
RC20BF154K
RC20BF104K
RC20BF271K
RC20BF125K
RC20BF104K
RC20BF823K
RC20BF225K
RC20BF102K
RC20BF224K
RC20BF824K
R50160-3
RC20BF153K
RC20BF224K
RC20BF102K
RC20BF224K
RC20BF273K
RC20BF101K
RC20BF183K
RC20BF473K
RC20BF102K
RC20BF473K
RC30BF223K
RC20BF102K
RC20BF335K
RC20BF271K
RC20BF181K
RC20BF474K
RC20BF104J
RC20BF683K
RC20BF152K
RC20BF102K
RC20BF682K
RC20BF334K
RC20BF333J
R50160-20
R50160-3
RC20BF823K
R50160-3
RC20BF104K
RC20BF103K
RC20BF104K
RC20BF100K
RC20BF103K
RC20BF100K
RC30BF334K
RC30BF272K
RC30BF334K
RC30BF272K
RC20BF475K
RC20BF224K
R33DC474J
RC20BF395K
RC20BF105K
RC20BF105K
RC20BF471K
RC20BF274K
RC20BF334K
RC20BF274K
RC20BF473K

R139, 140 Dep. carbon, 470K 5%, 1/3W
R141 Composition 220
R142 Composition 10K
R143 Composition 220
R144, 145 Composition 10K
R146, 147 Composition 22K
R148 Composition 10K
R149 Potentiometer, dual, 100K, volume
R150 Potentiometer, dual, 1M, Bass
R151 Potentiometer, dual, 500K, treble
R152, 153 Composition 10M
R154, 155 Composition 470K
R156, 157 Composition 1.8K
R158, 159 Composition 100K
R160, 161 Composition 2.2M
R162 Composition 100K
R163 Composition 1.8K
R164 Composition 1.5M
R165 Composition 100K
R166 Composition 1.8K
R167 Composition 1.5M
R168 Potentiometer, triple, 500K, balance
250K, center ch. volume
R169, 170 Composition 1M
R171, 172 Composition, 68K, 5%
R173 Composition, 330K, 5%
R174 Composition, 1.5K
R175 Composition, 27K
R176 Composition 1.5K
R177 Composition 47K
R178 Composition, 470K, 5%
R179 Composition, 47K
R180 Composition 470K
R181 Composition 470K
R182, 183 Composition, 470K
R184 Composition 330K 5%

R33DC474J
RC20BF221K
RC20BF103K
RC20BF221K
RC20BF103K
RC20BF223K
RC20BF103K
R50160-29
R50160-30
R50160-28
RC20BF105K
RC20BF474K
RC20BF182K
RC20BF104K
RC20BF225K
RC20BF104K
RC20BF182K
RC20BF155K
RC20BF104K
RC20BF182K
RC20BF155K
R50160-31
RC20BF105K
RC20BF683J
RC20BF334J
RC20BF152K
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RC20BF334J

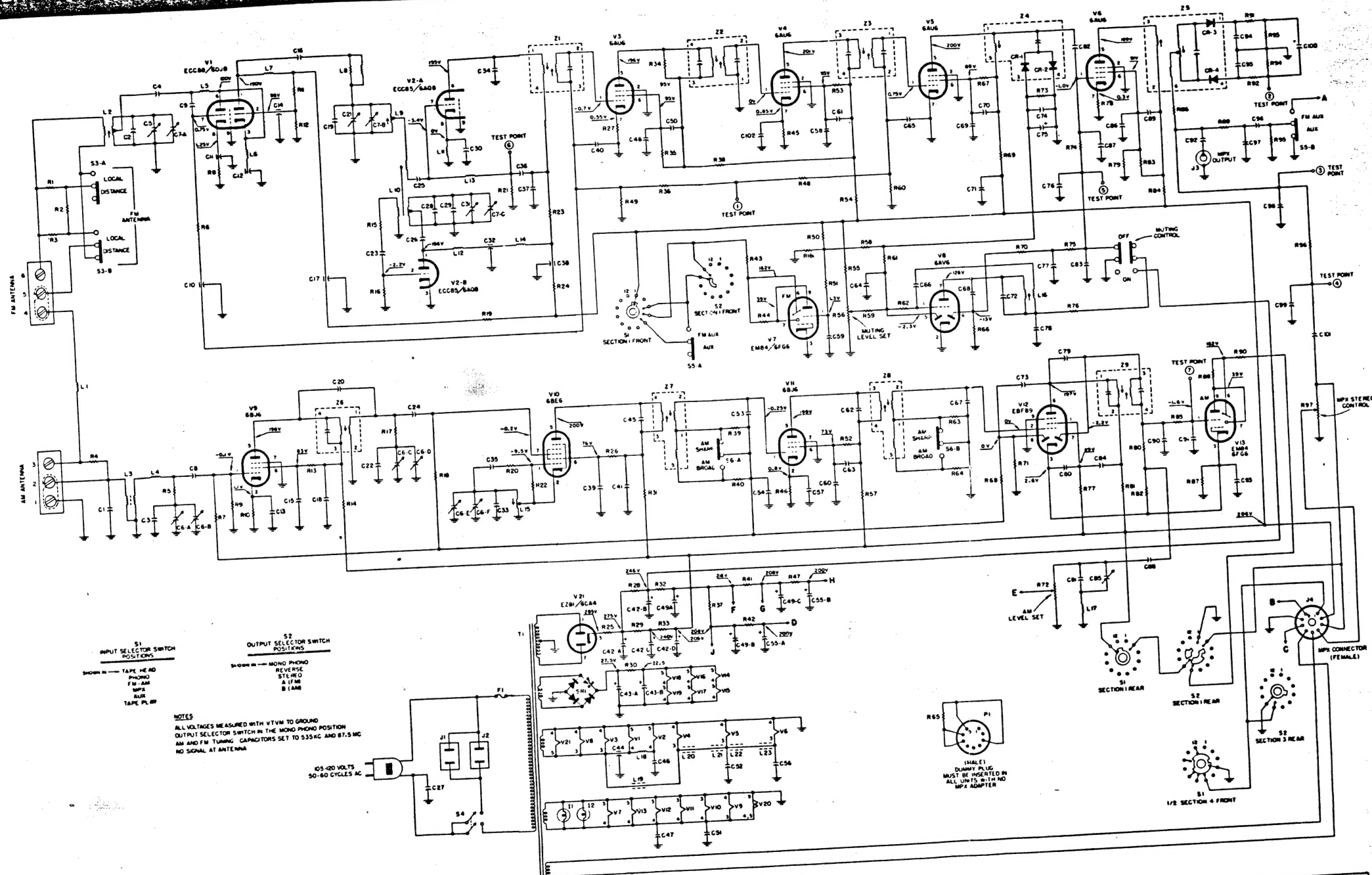
COILS, CHOKES AND TRANSFORMERS

Symbol	Description	Part No.
L1	Choke, 3.3 micro henries	L50066-8
L2	Coil, FM Antenna	L726-124
L3	Coil, FM Antenna	L721-139
L4	AM Ferrite Antenna	L721-136
L5	Choke, 1 micro henry	L50066-2
L6, 7	Choke, .56 micro henries	L50066-19
L8	Choke, R.F.	L629-180
L9	Coil, FM, R.F.	L726-126
L10	Coil, FM, osc.	L726-125
L11	Choke, .56 micro henries	L50066-19
L12, 13	Choke, 1 micro henry	L50066-2
L14	Choke, 1.2 micro henries	L50066-3
L15	Coil, AM, osc.	L50210-22
L16	Coil, muting, osc.	L50210-21
L17	Coil, 10KC, filter	L644-120
L18	Choke, 1.2 micro henries	L50066-3
L19, 20	Choke, filament ferrite bead	L592-189
21, 22, 23		
T1	Transformer, power	T721-115
Z1	Transformer, FM, I.F.	ZZ662-117
Z2	Transformer, FM, I.F.	ZZ629-142
Z3	Transformer, FM, I.F.	ZZ50210-2
Z4	Coil, FM, limiter	L551-121
Z5	Transformer, FM, Ratio Detector	ZZ592-170
Z6	Transformer, AM, R.F.	L670-151
Z7, 8	Transformer, AM, I.F.	ZZ50210-3
Z9	Transformer, AM, I.F.	ZZ2984

MISCELLANEOUS

Symbol	Description	Part No.
CR1, 2	Crystal diode, Type 1N295	V-1N295
CR3, 4	Crystal diode, Type 1N542, matched pair	V-1N542
F1	Fuse, 3 amp.	F-3000
I1, 2	Lamp, dial panel	I-50082-3
P1, 2	Plug, 9-pin	P-50181
PC1, 2	Printed circuit, Phono Equalization	PC50187-3
PC3, 5	Printed circuit, Tone Control	PC657-140
PC4, 6	Printed circuit, High Freq. filter	PC50187-2
S1	Switch, selector	S721-145
S2	Switch, mono stereo	S721-144
S3, 5, 6,	Switch slide	S50200-2
7, 8, 9,		-or-
11, 12		S50200-4
S4	Switch, power	Part of R149
S10	Switch, loudness	Part of R149
SR1	Selenium rectifier	SR721-143

SCHEMATIC DIAGRAM • FM-AM TUNING SECTIONS



RESISTORS	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15	R16	R17	R18	R19	R20	R21	R22	R23	R24	R25	R26	R27	R28	R29	R30	R31	R32	R33	R34	R35	R36	R37	R38	R39	R40	R41	R42	R43	R44	R45	R46	R47	R48	R49	R50	R51	R52	R53	R54	R55	R56	R57	R58	R59	R60	R61	R62	R63	R64	R65	R66	R67	R68	R69	R70	R71	R72	R73	R74	R75	R76	R77	R78	R79	R80	R81	R82	R83	R84	R85	R86	R87	R88	R89	R90	R91	R92	R93	R94	R95	R96	R97	R98	R99	R100
CAPACITORS	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16	C17	C18	C19	C20	C21	C22	C23	C24	C25	C26	C27	C28	C29	C30	C31	C32	C33	C34	C35	C36	C37	C38	C39	C40	C41	C42	C43	C44	C45	C46	C47	C48	C49	C50	C51	C52	C53	C54	C55	C56	C57	C58	C59	C60	C61	C62	C63	C64	C65	C66	C67	C68	C69	C70	C71	C72	C73	C74	C75	C76	C77	C78	C79	C80	C81	C82	C83	C84	C85	C86	C87	C88	C89	C90	C91	C92	C93	C94	C95	C96	C97	C98	C99	C100

TUBE LAYOUT

